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**19980003879** Advisory Group for Aerospace Research and Development, Aerospace Medical Panel, Neuilly-Sur-Seine, France  
**Impact Head Injury: Responses, Mechanisms, Tolerance, Treatment and Countermeasures** *Les Traumatismes Craniens Consecutifs aux Impacts: Les Mecanismes, la Tolerance, le Traitement et les Contremesures*

Nov. 1997; 242p; In English; Impact Head Injury: Responses, Mechanisms, Tolerance, Treatment and Countermeasures, 7-9 Nov. 1996, Mescalero, NM, USA; Also announced as 19980003880 through 19980003902

Report No.(s): AGARD-CP-597; ISBN 92-836-1062-8; Copyright Waived; Avail: CASI; A11, Hardcopy; A03, Microfiche

These proceedings include the Technical Evaluation Report, a Keynote Address, and 23 invited papers, of the Specialists' Meeting sponsored jointly by the AGARD Aerospace Medical Panel, the Stapp Car Crash Conference Advisory Committee and the Society of Automotive Engineers. Severe head injury resulting from vehicular accidents is a major concern to military and civilian health care workers. Significant advances have been made in the understanding of the causes of severe brain injury and in the factors, both direct and indirect, that contribute to the pathophysiological changes that follow from a severe head injury. Moreover, advances in design and the proper use of countermeasures can significantly reduce head injuries causing death. This Specialists' Meeting addressed the issues of severe head injury from the point of view of: (a) the dynamic response of the head during impacts; (b) brain injury mechanisms in diffuse axonal injury; (c) physical and computer models for assessing injury severity; (d) human tolerance and injury criteria; (e) head injury assessment and treatment; (f) epidemiology in head injury mishaps; (g) harmonization and enforcement of standards for protective head gear; (h) personal protective systems in aircraft; and (i) computer simulations for optimizing head impact protective designs. These proceedings will be of interest to military and civilian medical professionals, accident investigators, safety engineers and research scientists concerned with safety issues in vehicular crash protection. They will also benefit the research manager and scientist or flight surgeon requiring a state-of-the-art review of relevant research in the field of impact head protection.

Author

*Conferences; Countermeasures; Crashes; Dynamic Response; Head (Anatomy); Human Tolerances; Crash Injuries; Brain Damage; Damage Assessment; Biodynamics; Impact Damage; Impact Resistance; Impact Tests; Physiological Effects*

**19980011519** Advisory Group for Aerospace Research and Development, Fluid Dynamics Panel, Neuilly-Sur-Seine, France  
**Ice Accretion Simulation** *La Simulation de l'Accumulation de Glace*

Dec. 1997; 184p; In English

Report No.(s): AGARD-AR-344; ISBN 92-836-1067-9; Copyright Waived; Avail: CASI; A09, Hardcopy; A02, Microfiche

Ice Accretion Simulation is an important issue for flight safety. Every year several incidents happen which can be associated with severe icing problems. Although the bulk of them may be due to human mistakes during flight in icing conditions, some cases remain which are consequences of icing conditions never observed before or of failures not foreseen. Therefore, icing has always attracted great interest from aircraft manufacturers, authorities responsible for certification, and many researchers. The overall goal of the work presented in this report is to improve reliability, to reduce efforts and costs in civil and military aircraft certifica-

tion/qualification procedures, and to improve civil and military aircraft flight safety. This report covers the effects of ice accretion on wings, tail surfaces, engine inlets, and rotary wings. Experimentally, besides the capability of icing wind tunnel facilities, the problems of spray tanker aircraft experiments are considered, the related similarity laws are examined, and the techniques for measuring droplet size and distribution are reviewed. The basic factors influencing computational predictions are discussed in detail, especially factors such as surface roughness and surface heat transfer. In addition to the 2D prediction methodology, the status of extensions to 3D is presented. An essential aim of a planned follow-on activity should be to establish some well-documented reference cases by suitable in-flight experiments, and to calibrate prediction tools and experimental facilities and techniques for those reference cases.

Author

*Ice Formation; Simulation; Flight Safety; Reliability; Costs; Civil Aviation; Prediction Analysis Techniques; Attack Aircraft*

**19980016571** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine, France

**Future Aerospace Technology in the Service of the Alliance, Volume 2, Mission Systems Technologies** *Les Technologies Aeronautiques et Spatiales du Futur au Service de L'Alliance Atlantique, Volume 2, Les Technologies des Systemes de Conduite de Mission*

Future Aerospace Technology in the Service of the Alliance; Dec. 1997; 184p; In English; In French; The AGARD Symposium on 'Future Aerospace Technology in the Service of the Alliance', 14-17 Apr. 1997, Palaiseau, France; Also announced as 19980016572 through 19980016587

Report No.(s): AGARD-CP-600-Vol-2; ISBN 92-836-0048-7; Copyright Waived; Avail: CASI; A09, Hardcopy; A02, Microfiche

Advances in sensing and information processing/distribution technologies will enable highly innovative system concepts for achieving unprecedented improvements in military mission capabilities. Assessing those major technology advances, the symposium was structured in five sessions hosting twenty four papers: (1) Mission management concepts, introducing the subject, presenting technological requirements and giving as an example the unmanned tactical aircraft; (2) Sensors and electronic warfare, showing how emerging Radio Frequency and Electro-Optics technologies are able to offer improved situational awareness, but may also defeat apparently reliable weapons; (3) Information and communications systems, stressing the effective blending most likely to occur between market driven and specific military developments, as well as the need to account for the battlespace environment; (4) Information fusion and mission systems integration, demonstrating among others how data fusion which is required for matching the information rate to the human, will result in drastically improving its accuracy and reliability; and (5) System simulation, emphasizing the major role of simulation technologies for cost-effective design of new military systems, evaluation of existing ones, training of operators, and paving the way to the concept of synthetic environments. Based on emerging and rapidly evolving technologies, the presenters built a vision of future weapon systems capable of operating in a diverse range of hostile environments, under all weather conditions, and during day or night. Furthermore, autonomous situation appreciation capability, reliable communication channels and real-time decision aids were discussed, which will drastically reduce the operators' reaction time and prevent overload in a high target and threat density environment. The fruitful interaction with the audience confirmed the unique opportunity offered by this classified symposium to bring together experts working in the relevant sciences as well as the user community, and affiliated either with academia, industry, government organisations, or military services.

Author

*Mission Planning; Weapon Systems; Conferences; Electronic Warfare; Military Operations; Systems Engineering; Artificial Intelligence; Decision Making; Pattern Recognition; Global Positioning System; Telecommunication; Aircraft Detection; Avionics*

**19980018040** Advisory Group for Aerospace Research and Development, Aerospace Medical Panel, Neuilly-Sur-Seine, France

**3-D Surface Anthropometry: Review of Technologies** *L'Anthropometrie de Surface en Trois Dimensions: Examen des Technologies*

Dec. 1997; 192p; In English

Report No.(s): AGARD-AR-329; ISBN 92-836-1069-5; Copyright Waived; Avail: CASI; A09, Hardcopy; A02, Microfiche

This document, in seven chapters, describes the dramatic changes taking place in the field of anthropometry due to advances in 3-D imaging technology. Chapter I explains how 3-D technology can overcome many of the limitations of traditional anthropometry; Chapter II discusses applications for 3-D anthropometry; Chapter III compares traditional and 3-D data collection methods; Chapter IV discusses ways to display 3-D images for users of the data; Chapter V addresses database management issues; Chapter

VI explains how the latest user interface design techniques can help users of 3-D data; and Chapter VII examines 3-D data standardization issues and provides a list of current standards for 3-D data.

Author

*Anthropometry; Three Dimensional Models; Technologies; Reviewing; Data Acquisition; Data Management; Telecommunication*

**19980018468** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine, France

**Aerospace 2020, Volume 1 *Aeronautique et Espace a l'Horizon 2020, Volume 1***

Dec. 1997; 44p; In French; See also English translation, AGARD-AR-360-Vol-1

Report No.(s): AGARD-AR-360-Vol(F); ISBN 92-836-2001-1; Copyright Waived; Avail: CASI; A03, Hardcopy; A01, Microfiche

Volume 1, the summary volume, of the report of the NATO Advisory Group for Aerospace Research and Development (AGARD) study: 'Aerospace 2020'. This study explores the most advanced technologies, relevant to aerospace, being researched and developed in laboratories today. The study focuses on the most promising current technologies and the organizational and tactical consequences they will have at the field and system levels, over the course of the next 25 years. Topics include: a discussion of the impact of proliferation, human-machine interaction, synthetic environments, directed-energy weapons, information technologies, unmanned tactical aircraft, suborbital launchers, hypersonic missiles, and a discussion of affordability issues. Technologies are assessed from the viewpoints of both potential capabilities and threats. Observations and recommendations are presented.

Author

*Aerospace Engineering; Weapon Systems; North Atlantic Treaty Organization (NATO); Man Machine Systems; Hypersonics; Pilotless Aircraft; Fighter Aircraft*